

1 **CLAIMS**

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3 1. A processor-readable medium comprising processor-executable
4 instructions configured for:

5 identifying instructions executing on a processor;
6 receiving power consumption data from a power measurement circuit; and
7 correlating the power consumption data with the identified instructions.

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9 2. A processor-readable medium as recited in claim 1, wherein the
10 identifying comprises:

11 interrupting the processor;
12 sampling a program counter of the processor;
13 scanning a lookup table to find an address indicated by the program
14 counter; and
15 determining an instruction located at the address.

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17 3. A processor-readable medium as recited in claim 1, wherein the
18 receiving comprises:

19 querying the power measurement circuit; and
20 receiving digital power readings from the power measurement circuit based
21 on the querying.

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23 4. A processor-readable medium as recited in claim 1, wherein the
24 receiving comprises receiving digital power readings from the power measurement
25 circuit at preset time intervals.

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2 5. A processor-readable medium as recited in claim 1, wherein the
3 correlating comprises associating with an identified instruction, a measured
4 amount of power consumed during execution of the identified instruction on the
5 processor.

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7 6. A processor-readable medium as recited in claim 1, wherein the
8 correlating comprises generating a power profile that includes a plurality of power
9 consumption values and a plurality of identified instructions, wherein each power
10 consumption value is associated with an identified instruction in the power profile.

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12 7. A processor-readable medium as recited in claim 6, wherein the
13 power profile is selected from the group comprising:

14 a table having pairs of data, each pair of data comprising a power
15 consumption value and an identified instruction; and

16 a graph correlating power consumption values with identified instructions.

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18 8. A processor-readable medium as recited in claim 1, wherein the
19 power consumption data comprises power consumption values measured during
20 execution of the instructions on the processor.

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22 9. A processor-readable medium as recited in claim 1, wherein the
23 processor is a component of a device selected from the group comprising:

24 an embedded mobile PDA (personal digital assistant) computing device
25 operable by battery power;

1 a cell phone;
2 a smart phone;
3 a notebook computer;
4 a desktop PC (personal computer);
5 a workstation;
6 a server;
7 a mainframe computer; and
8 an Internet appliance.

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10 10. A processor-readable medium comprising processor-executable
11 instructions configured for associating a software instruction with an amount of
12 power consumed by executing the software instruction.

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14 11. A processor-readable medium as recited in claim 10, wherein the
15 associating comprises generating a power profile that matches software
16 instructions executing on an embedded device with corresponding power
17 consumption values measured during execution of the software instructions.

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19 12. A processor-readable medium comprising processor-executable
20 instructions configured for:

21 measuring power consumption of software instructions executing on a
22 target computing device;

23 converting analog power measurements into digital power measurements;

24 and

25 transmitting the digital power measurements to a host computer.

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2 13. A processor-readable medium as recited in claim 12, comprising
3 further processor-executable instructions configured for storing the digital power
4 measurements in a memory after the converting.

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6 14. A processor-readable medium as recited in claim 12, wherein the
7 transmitting comprises:

8 receiving a request for the digital power measurements from the host
9 computer; and

10 transmitting the digital power measurements to the host computer based on
11 the request.

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13 15. A processor-readable medium as recited in claim 12, wherein the
14 transmitting comprises transmitting the digital power measurements to the host
15 computer at preset time intervals.

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17 16. A processor-readable medium as recited in claim 12, wherein the
18 target computing device is selected from a group comprising:

19 an embedded mobile PDA (personal digital assistant);

20 a cell phone;

21 a smart phone;

22 a notebook computer;

23 a desktop PC (personal computer);

24 a workstation;

25 a server;

1 a mainframe computer; and
2 an Internet appliance.

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4 **17.** A method comprising generating a power profile that associates a
5 software instruction with an amount of power consumed during execution of the
6 software instruction.

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8 **18.** A method as recited in claim 17, wherein the execution of the
9 software instruction is performed by a processor on a target computing device and
10 the amount of power consumed is an amount of power consumed by the processor.

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12 **19.** A method as recited in claim 17, wherein the generating comprises:
13 identifying the software instruction executing on a processor;
14 receiving power consumption data from a power measurement circuit; and
15 correlating the power consumption data with the identified software
16 instruction.

17
18 **20.** A computer comprising a power profiler configured to identify
19 software instructions executing on a processor, receive power consumption data,
20 and correlate the power consumption data with the software instructions such that
21 each software instruction is associated with a power consumption value indicating
22 an amount of power consumed during the executing of the software instruction.

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24 **21.** A computer as recited in claim 20, further comprising a lookup table,
25 the power profiler further configured to monitor a program counter on the

1 processor and to identify the software instructions through the lookup table based
2 on the program counter.

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4 **22.** A computer as recited in claim 20, further comprising a power
5 profile having a plurality of power consumption values each paired with a
6 corresponding software instruction to indicate an amount of power consumed
7 during execution of the corresponding software instruction.

8
9 **23.** A computer comprising a power profiler configured to generate a
10 power profile that correlates software instructions with power consumed during
11 execution of the software instructions.

12
13 **24.** A computer comprising:
14 means for identifying instructions executing on a processor;
15 means for receiving power consumption data from a power measurement
16 circuit; and
17 means for generating a power profile that correlates the power consumption
18 data with the identified instructions.

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20 **25.** A computer as recited in claim 24, wherein the means for identifying
21 instructions comprises:
22 means for interrupting the processor;
23 means for sampling a program counter of the processor; and
24 means for determining an instruction based on the program counter.
25

1 **26.** A computer as recited in claim 24, wherein the means for receiving
2 comprises:

3 means for querying the power measurement circuit; and
4 means for receiving digital power readings from the power measurement
5 circuit based on the querying.

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7 **27.** A power measurement circuit comprising:
8 means for measuring power consumption of software instructions executing
9 on an embedded device;

10 means for converting analog power measurements into digital power
11 measurements; and

12 means for transmitting the digital power measurements to a host computer
13 in response to a query from the host computer.

14
15 **28.** A power measurement circuit as recited in claim 27, further
16 comprising means for storing the digital power measurements.

17
18 **29.** A computer comprising:
19 a processor;
20 instructions stored in a memory and executable on the processor; and
21 a power measurement circuit configured to measure power consumed by the
22 processor during execution of each instruction.

1 30. A computer as recited in claim 29, further comprising an analog to
2 digital converter integrated as part of the power measurement circuit and
3 configured to convert analog power signals to digital power consumption data.

4
5 31. The computer of claim 29 implemented as a device selected from the
6 group comprising:

7 an embedded mobile PDA (personal digital assistant);

8 a cell phone;

9 a smart phone;

10 a notebook computer;

11 a desktop PC (personal computer);

12 a workstation;

13 a server;

14 a mainframe computer; and

15 an Internet appliance.

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17 32. A system comprising:

18 a power profiler configured to correlate an identified software instruction
19 with an amount of power consumed during execution of the identified software
20 instruction;

21 a lookup table having information for identifying the identified software
22 instruction; and

23 a power profile generated by the power profiler and having power
24 consumption values and identified software instructions, each power consumption
25 value paired with a corresponding identified software instruction.

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33. A system as recited in claim 32, further comprising:

a power measurement circuit configured to measure the amount of power consumed during execution of the identified software instruction; and
an analog to digital converter configured as part of the power measurement circuit to convert analog power consumption measurements into digital power consumption data.

34. A system as recited in claim 33, wherein the power measurement circuit is a component of a target computing device on which the identified software instruction is executed.